ZOOLOG

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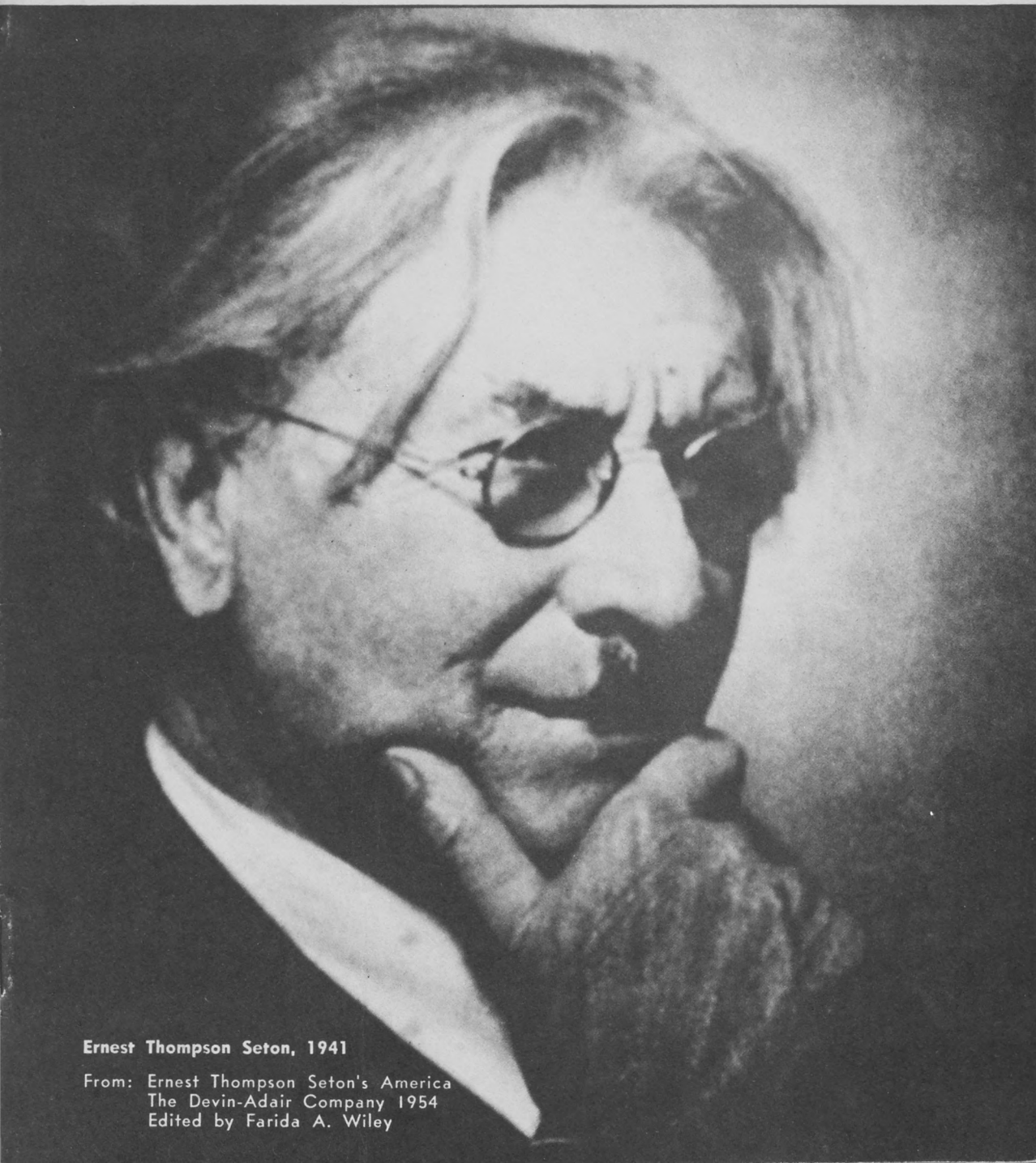

Ernest Thompson Seton, 1941

From: Ernest Thompson Seton's America
The Devin-Adair Company 1954
Edited by Farida A. Wiley

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President's Message

I am extremely conscious of the honour which the Zoological Society has placed upon me by appointing me President. I shall try my best to fulfill this responsibility and to make the Society a significant force in the appreciation and wise development of the Assiniboine Park Zoo and in a wider context of the natural resources of our province.

I am particularly pleased that our Past President, Mr. George Heffelfinger, will remain in the Council of the Society as Chairman of the Board of Directors. Mr. Heffelfinger has played a very significant role in the development of the Society and will continue to do so in his new position.

Several new opportunities for Society activity have and will arise. I intend that the Society shall accept these challenges and develop a fuller programme. This will require a re-examination of our educational, research, and administrative objectives. I shall be in touch with our Directors and shall solicit their advice and assistance. From time to time our activities will be reported to members through ZOOLOG and communications from our Secretary.

Harold E. Welch, M.Sc., Ph.D.
Professor and Head
Department of Zoology
University of Manitoba

From:
Grus Americana
Quarterly Newsletter
Whooping Crane Conservation Association Volume 8, Number 1, March 1969

THE PRESIDENT'S REPORT

Today we are being conditioned to expect or demand instant remedies to our problems. Unfortunately, our impatience for change or so-called improvement often leads to premature and wrong decisions; a change of direction or emphasis to result in no answer at all, but serves to keep some happy for the attention they think they received in the shuffle.

The vast majority are hard-working folks, who unfortunately are having their minds made up by these minority pressure groups. We were misunderstood in the beginning when some failed to see the value of the Whooping Crane Management Program. A trip to the prairies to see the pitiful remnants of our Wetlands should convince even the most stubborn. Believe me, it's only a matter of time until the prairie marsh will have vanished completely.

The executive and members are working to slow down change and prevent what would be another **credit** to Man's long list of crimes against Nature.

Fred G. Bard
Museum of Natural History
Regina, Saskatchewan

Ernest Thompson Seton, 1901

From: Town Topics, May 25, 1901
Sketch labelled:
Ernest — Seton — Thompson
promoting illustrated lecture at
Winnipeg Auditorium Rink

Ernest Thompson Seton and Manitoba

Ernest Thompson Seton is perhaps the best known of all writers of animal stories. As a founder of the Boy Scout movement in America, and as an author and lecturer, he achieved much of his fame in the United States of America. What is less well known is that Seton was for several years a resident of Manitoba, served here as Provincial Naturalist, and did much of his scientific observation in the Carberry area.

He was born in South Shields, Durham, England in 1860. He was direct descendant of the last Scottish Earl of Winton, and has been himself described as a "Canny Scot." When he was five his family moved to Canada and farmed unsuccessfully in backwoods Ontario near Lindsay. Four years later, they moved to Toronto where young Seton attended school, became a portraitist's assistant, and enrolled in evening classes in the Ontario Art School. During this time he made intensive observations on local animals, which were the subjects of some of the stories in his most famous book "Wild Animals I Have Known" which was published many years later. In 1879 he won a Gold Medal Award in art and the following year went to London to attend the Royal Academy School of Painting and Sculpture. In 1881 he moved with two brothers to Carberry in Manitoba, and lived for most of the next six years in that area, observing and recording bird and mammal life, and starting a series of daily scientific records which continued for sixty years. He started in 1883 a long series of scientific publications on the birds and mammals of the region which appeared in the journal Auk, the proceedings of the U.S. National Museum, in other journals, and in several books. In 1890 he moved to Paris for further studies in art at the Julian Academy. When he returned to the New World, he took up residence in the U.S.A. for most of the remainder of his long life, but he returned many times for further scientific expeditions in Canada. While living in Manitoba, he served as Provincial Naturalist and published here his "Birds of Manitoba" in 1891, (under the authorship of E. E. Thompson, a name which he subsequently altered). In 1909, he published the important scientific work "Life Histories of Northern Animals: an account of the mammals of Manitoba", and is there listed as Naturalist to the Government of Manitoba. This two volume study was later expanded into a monumental "Lives of Game Animals" in 1925-1928. This 3,000 page treatise, based on 50 volumes of his personal records, is still sufficiently authoritative that it was re-issued in 1953.

In 1907, Seton made an extended canoe voyage to the barren grounds of Canada, accompanied by E. A. Preble, Chief of the U.S. Bureau of Biological Survey. The results of this expedition, which was designed to observe the Caribou, were described in Seton's book "The Arctic Prairies" in 1911. When the British Association for the Advancement of Science met in Winnipeg in 1909, Seton wrote an account of the mammals and birds of the area "Fauna of Manitoba". In 1918, he produced the first list of the turtles, snakes, and amphibians of Manitoba, published in the Ottawa Naturalist. In addition to these publications, a great deal of the observational material in Seton's prodigious literary output (over 40 books related to zoology and natural history) was gathered in Canada.

Ernest Thompson Seton is known through-out the world as founder of the modern school of animal-story writing, in which the actual facts of the animal's life are given in fictional form. Rudyard Kipling acknowledges the inspiration of Seton in Kipling's own animal stories, and Charles G. D. Roberts followed the same pattern. In modern eyes, these stories contain much that is anthropomorphic, but they also conveyed a great deal of accurate observational material, and had an enormous impact upon the public's awareness of wildlife and ecology when they first appeared.

But his reputation as a Zoologist does not depend upon his ability to popularize natural history. The wealth of ac-

curate information in his "Lives of Game Animals" and in several smaller volumes has never been equalled. Many of his observations on animals in the relatively undisturbed environment of Manitoba at the end of the last century form the basis from which we must measure ecological change to the present time. Seton has been called "The Dean of American Naturalists." He was elected an Associate of the American Ornithologist's Union in 1883, and maintained a continuous membership in the Union extending over sixty-three years. He was a Member of the American Institute of Arts and Letters, a Fellow of the New York Zoological Society, a Medalist of the Société d'Acclimation of France, and recipient of innumerable honours and awards.

Seton's powers of accurate observation were in part due to the fact that he was a trained and highly competent artist. During his studies in London and in Paris he mastered animal anatomy, and in 1896 wrote a text book for the illustration of living animals. His books are profusely illustrated, sometimes with scientific diagrams of skulls or anatomy, and frequently with sketches or formal portraits done from life. Seton was acknowledged as one of the finest animal illustrators of all time. He illustrated the "Century Dictionary", and Chapman's "Bird Life" in 1897. He published a manual of animal tracks which has recently been re-issued.

Seton's principal interest in animals concerned their behavior, psychology or ethology (although these terms were not yet current). He was often ahead of his time, and his work frequently suggests later studies by Lorenz, Von Frisch, "The Naked Ape" or "The Territorial Imperative." In the introduction to "Lives of Game Animals" Seton wrote "In the idea of a home region is the germ of territorial rights. At every step it presents close and interesting parallels with the growth of territorial law in man". For each species of animal in this work, he included sections on migrations, food, numbers, property, storage habit, relation to light, sociability, means of communication, senses, and training of the young. His emphasis on behavior is exemplified from the following quotation:

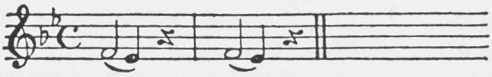
> "As this is a book of life histories or habits, I have occupied myself as little as possible with anatomy, and have given only so much description of each animal as is necessary for identification. My theme is **"The Living Animal."** No one who believes in Evolution can doubt that man's mind, as well as his body, had its origin in the animals below him. Otherwise expressed, we may say that: Just as surely as we find among the wild animals the germs or beginnings of man's material make-up, so surely may we find there also the foundations and possibilities of what he has attained to in the world of mind. This thought lends new interest to the doings of animals in their home-life, and I have sought among these our lesser brethren for evidences of it — in the rudiments of speech, sign-language, musical sense, aesthetics, amusements, home-making, social system, sanitation, wed-law, morals, personal and territorial property law, etc. As much as possible, I have kept my theories apart from my facts, in order that the reader may judge the former for himself."

While in Carberry, Manitoba, Seton made some observations and primitive experiments on the innate behavior of young grouse. He was one of the first to attempt to quantify the cries of birds (as shown in the opposite page of musical staves illustrating crow calls). His interpretations were somewhat imaginative, but his observations were original and accurate, and form the basis for much subsequent work in animal psychology.

C. C. Lindsey
Department of Zoology
University of Manitoba


ca ca ca ca Caw


Caw Caw ca ca ca ca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Our Zoo Animal Collection

Gunter Voss, Dr. rer. nat.

"Can you name the six kinds of deer native to Manitoba?", I have oftentimes asked applicants for Zoo jobs, sons or daughters of our fine province. Usually the applicants, interested in native wildlife, had observed a variety of deer at large, but they were not so sure whether an Elk or a Moose was a deer or not.

First of all, which are the deer native to Manitoba? In the order of increasing size, here they are:

White-tailed Deer, Odocoileus virginianus

Mule Deer, Odocoileus hemionus

Barren Ground Caribou, Rangifer tarandus arcticus

Woodland Caribou, Rangifer tarandus caribou

Manitoba Wapiti or Elk, Cervus canadensis manitobensis

Moose, Alces alces americana.

The always useful "Field Guide to the Mammals" by W. H. Burt and R. P. Grossenheider (The Peterson Field Guide Series) defines deer for the North American reader as follows: "This family includes hoofed mammals that have antlers which are shed each year. It includes our Deer, Elk, Moose and Caribou."

As we look at the deer a little more scientifically, Desmond Morris' book on The Mammals (Hodder & Stoughton, London 1965) serves as a quick guide. We recall that the order Artiodactyla (Even-toed Ungulates) comprises the three suborders Suiformes (Pigs, Peccaries and Hippopotamuses), Tylopoda (Llamas and Camels) and Ruminantia (Ruminants). The Ruminants consist of the two infraorders Tragulina (Chevrotains) and Pecora ("Hornbearers"). Pecora include three superfamilies, but to clarify matters, let us draw a chart.

Order
Artiodactyla

Suborders
Suiformes
Tylopoda
Ruminantia

Infraorders
Tragulina
Pecora

Superfamilies

Families

Cervoidea
Cervidae (Deer)
Giraffoidea
Giraffidae (Okapi and Giraffe)
Bovoidea
Antilocapridae (Pronghorn)
Bovidae (Antelopes, Cattle, Goats, Muskox and Sheep)

One thing has to be remembered — that the translation of Pecora was put in quotation marks. Deer do not possess horns. They have antlers. They have antlers in both sexes — the Reindeer and Caribou, no antlers — the Musk Deer and Water Deer, or antlers usually in the male sex only — the large majority of deer.

Antlers are composed of solid bone, supported by permanent pedicels which extend from the frontal bones of the skull. As antlers grow, they are covered with a finely haired coating, rich in blood vessels. This cover is known as velvet. When antler growth has been completed, the velvet becomes dry and is rubbed off. Antlers are present in pairs. They are usually dropped once a year. New ones soon start to grow again.

Paul Geraghty, 1968

Antlers
of Roe Deer, Moose,
Mule Deer and Milu (Père David's Deer)

As is the case in biology quite often, there are exceptions. In our Zoo's herd of Pere David's Deer, where the stags are supposed to be the only bearers of antlers, there is a female specimen with tiny outgrowths on her head, undeniably antlers. But nothing is wrong with her. She is a good female, even breeding. Still speaking of the incomparable Pere David's Deer, the stags we have kept would shed antlers twice a year. They put a small pair on in winter and good, normal looking pairs of antlers for the period of rut in June and July. G. Kenneth Whitehead in his extraordinary book "Deer and their management" (Country Life Ltd., London, 1950) suggests that the growth of a second set of antlers within one year occurs only in response to abundant feeding. The late Lee S. Crandall reports of the experience with Pere David's Deer at the Bronx Zoo of the New York Zoological Society. Only once, in 1954, did the herd stag at the Bronx Zoo grow two pairs of antlers in one year. We are still compiling data on antler growth at our Assiniboine Park Zoo. They will eventually be published.

We have seen another two cases of antler abnormality in our Winnipeg collection. Once a spotted Fallow Deer carried his old, bony first-year antler on one side riding on top of the velvet-covered, new growth for longer than two weeks before it dropped. Then we had a Reindeer buck whose antler on one side was twinned, not split but doubled for its full length, although the pedicel below appeared unharmed. This stag grew normal antlers the following year.

Robert Bean, Sr., formerly Director of the Chicago Zoological Park at Brookfield, donated a Pere David's Deer stag to our Zoological Society of Manitoba, thereby establishing this fascinating species in our collection in 1959. Professor Dr. Richard Glover, Past-President of our Zoological Society, was instrumental in the acquisition of Formosan Sika and European Red Deer. Numerous specimens of Northern White-tailed Deer and several Moose and Manitoba Wapiti have been received from the Manitoba Wildlife Branch under the directorships of G. W. Malaher and Dr. Ken Doan. We must be thankful to all of them for having helped us accummulate a deer collection as fine as ours is.

If our information is correct, Siberian Roe Deer can nowhere be seen in the western world but in the Zoological Parks of Munich, Berlin, Catskill and Winnipeg. And the charming Mule Deer are bred here in larger quantities than by any Zoo outside of Winnipeg. We have raised no less than 49 Mule Deer fawns, all Assiniboine-Park-Zoo-born, in the last five years alone.

Still we are learning. The management of deer is an intriguing art. Right now we are puzzled by a Muntjac doe which is presenting a live example of superfecundity; we try to outsmarten our Red Deer stag who becomes aggressive at this season of the year, but would look so miserable, de-antlered; we eargerly anticipate completion of an ecological exhibit, in which, among many other creatures, another kind of deer, the Barasingha from India shall find accommodation. We enjoy to care for deer, and we keep learning.

Parasites:

via Air Mail

Every hunter knows the story of waterfowl migration. Our Manitoba population of ducks is a conglomerate of birds that have flown north along three flyways, the Central, Mississippi and Atlantic to find their summer home in this province. Unknown or unrealized, are the vast numbers of animal passengers that waterfowl bring with them each spring and take away each autumn. The story of these parasites is, perhaps, more interesting than that of the annual migrations of waterfowl.

Several University of Manitoba students have studied these parasites at the Delta Waterfowl Research Station of Dr. A. Hochbaum. Their studies centre on the cycle of the parasites, in particular, the internal parasites of the gut and tissue, and their effect on the wild duck populations.

Each spring the ducks arrive from the various flyways bringing with them a burden of parasites. These are of four main types: the one-celled animals or Protozoa, the flukes or Trematoda, the tapeworms or Cestoda, and roundworms or Nematoda. Most of these parasites are peculiar in that they must pass through at least one different host (the intermediate) before they are sufficiently developed to infect a duck and to become reproductively mature. In flukes it is usually a snail that acts as an intermediate host; the same purpose in tapeworms is served by a small aquatic animal known as a copepod; while roundworms utilize a water flea or freshwater shrimp.

Eggs of the parasites are released and voided from the duck into the marsh water in late spring. Eggs are eaten by the intermediate hosts and develop into resting stages. These intermediate hosts are part of the food eaten by newly hatched ducklings and adults. The parasites emerge from the digested intermediate hosts, attach themselves to the gut wall, and mature. Sometimes, there is sufficient time for another cycle of the parasite, but often the worm has barely matured by the time the ducks fly south. A generation of parasites originating in Delta Marsh may give birth to the next generation in Mexico, and these, in turn, come north to Delta to produce the third generation. The parasite migration resembles that of ducks except that each trip involves a new generation.

What evidence is there for this parasitic migration? Mr. Vince Crichton found in the autumn of 1967 that late migrating Mallards had 15 species of parasitic worms, and Pintails, nine species. The following spring, the early migrating Mallards arriving at Delta had 16 species of parasites and the Pintails, nine. In mid summer Mallards and Pintails shared twenty different species of parasites. The Pintails acquired more parasites with the passage of the summer, presumably from the Mallards, a bird frequently found with Pintails. In early June, 1967, Mr. Crichton found in a Pintail a fluke of a kind previously known only from Brazil. This was an intriguing discovery and led one to speculate that the parasite may have been brought from Central or South America where Pintails are known to overwinter.

Frequently hunters ask if parasites kill ducks. Our evidence suggests that parasites do not kill ducks in normally healthy wild populations. By 'healthy' we mean populations that are uncrowded, not starved, and unstressed. Where ducks are crowded, as in artificial feeding sites, then the chances of spreading parasites are increased and ducks may receive a heavy burden of parasites that may prove fatal.

A potential threat to ducks and geese at Assiniboine Park Zoo several years ago focussed attention on the lethal nematode parasite, Echinuria uncinata. Dead ducks were autopsied and the parasite identified. Its intermediate host is the water flea, and the immediate drainage of the duck pond removed the source of infection. These experiences at the Zoo stimulated research on this parasite in wild waterfowl at Delta. Mr. Fred Austin examined and was able to create in the laboratory conditions under which water fleas become infected. With these he infected ducklings and found parasitic damage that was proportional to the degree of parasitic infections. Conditions necessary for acute infection appear to occur chiefly at artificial rearing sites, and rarely in the wild.

In 1966 an American biologist reported a much heavier parasite burden in diseased than in healthy Canvasbacks. The diseased condition of the birds was attributed to their feeding in a section of the Detroit River that was heavily polluted by industrial wastes. These and other observations on Mallards and Pintails by Mr. Crichton suggested that birds under stress may be killed or damaged by parasites. Mr. Phillip Ould has initiated studies on this problem and shown that birds under the stress of crowding are more susceptible to parasite infection. These studies will continue and are important to both waterfowl management and to the maintenance of animals in captivity.

The basic question of how the parasites became adapted to the annual migration of their waterfowl hosts remains unanswered. Perhaps it will be answered some day but for the present we can only make the obvious point that it occurs and is another example of the complexity of Nature.

H. E. Welch,
Department of Zoology
University of Manitoba

Manitoba Rivers

PART I: **Hydrology**

The Seal, Churchill, Nelson, Hayes, Saskatchewan, Assiniboine, Red, and Winnipeg; Manitoba's principal rivers, follow a pattern that was established in central Canada billions of years ago in geological history. The pattern today is also the product of the rivers themselves, for rivers are largely self-forming, within a given system of bedrock and unconsolidated deposits.

To understand rivers and river behaviour in Manitoba, we should first ask, why are there rivers? The rudimentary answer lies in the excess of solar energy received per unit area at the equator as compared to the poles. On the average the equator is not heating and the poles are not cooling, therefore there must be a mechanism or "heat engine" that counters the imbalance of received energies. The engine is a combination of oceanic and atmospheric circulation that transfers just enough heat poleward to maintain the earth's mean temperature distribution.

The atmospheric circulation developed is fundamental to the creation and maintenance of rivers. Each year approximately 130 inches of precipitable water vapour evaporated from the Pacific Ocean passes eastward over the western coast of the central portion of North America. Surprisingly, 121 inches of water vapour passes over the eastern coast of the continent. The nine inch difference between incoming and outgoing atmospheric water vapour provides the net annual runoff for our river systems.

The runoff process is more complex than this gross water budget would indicate. Approximately 30 inches of the incoming water vapour is precipitated out over the continent and approximately 21 inches is returned to the atmosphere by evapo-transpiration, two major components of the water budget.

Hydrology is the field concerned with the inter-relationships, particularly in time, between the components of the water budget. The components are basically rainfall, evaporation, surface runoff, infiltration, transpiration by plants, groundwater flow, and stream flow. They are simply related as follows: rain falls on plants and the land surface where a large portion is returned to the atmosphere by evaporation. The remaining portion is divided between direct surface runoff and infiltration in the ground. The infiltration portion in turn contributes to the groundwater flow system and to the transpiration component. The net groundwater flow and the direct runoff then combine to produce river flows and ultimately rivers as we know them. The portion of groundwater flow that does not contribute to river flow is very small, approximately only 1/100th of the net water budget.

Each of the processes involved in producing river flows has its own characteristics; each responds differently and at different rates to short bursts of rainfall. In Canada, a further time variable must be added to the system, the effect of winter. Precipitation during the winter is effectively accumulated as snow cover and stored until the spring melting period.

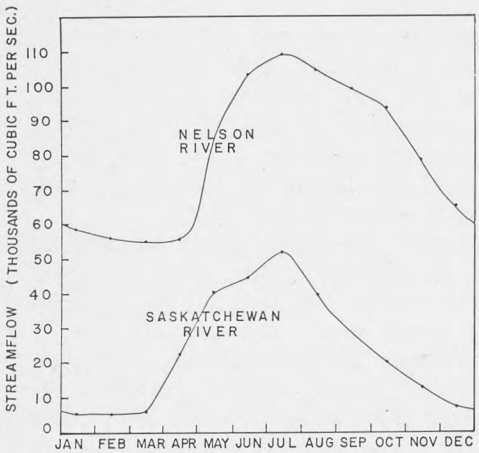
The precise inter-relationship between processes is not yet fully understood but we do understand the product, the annual river hydrograph, a plot of river flows versus time. The mean annual hydrograph shown for the Saskatchewan River in Figure 1 is the product of groundwater flow and direct runoff. In the hydrograph the November to March river flows are maintained by groundwater flow. The rising flows in April, May, June and July are produced by the combination of groundwater, snowmelt water and summer rains. In the late summer only the groundwater and rainfall components remain to produce decreasing flows until the winter storage effect recurs and only groundwater acts again to maintain the low winter flows.

TABLE I

MANITOBA RIVERS	Drainage Area (Miles)	Mean Discharge (Cubic feet per second)
Nelson River	414,000	72,000
Nelson River Tributaries		
Saskatchewan River	130,000	24,000
Red-Assiniboine Rivers	111,000	6,000
Winnipeg River	52,000	27,000
Churchill River	115,000	21,000
Hayes River	36,000	12,000*
Seal River	Unknown	

* Approximately

Figure 1



MEAN ANNUAL HYDROGRAPHS

If the Saskatchewan River hydrograph is compared to the Nelson River hydrograph, also shown in Figure 1, two major differences are apparent. The first is that the annual volume of flow in the Nelson is several times larger than that of the Saskatchewan. This is because the drainage area of the Nelson is greater than the drainage area of the Saskatchewan. The several major rivers that combine in Lake Winnipeg to produce the Nelson River are identified in Table I.

The second major difference between the Saskatchewan and Nelson hydrographs is that the ratio of the low winter flows to the high summer flows is much smaller on the Nelson. On the average, flows down the Nelson are largely maintained during the winter. This is due to the final major phenomenon important to understanding river and lake behaviour: the effects of lake storage on river flows.

There is an analogy between groundwater storage and lake storage for the result of each is the same. Water is stored in the ground or on a lake and released slowly as the groundwater level or lake level falls. The net effect is to reduce short intense bursts of water such as that produced during the spring snowmelt period or during a rainstorm to lower but more extended flows. The surface area of Lake Winnipeg is 9,400 square miles. If the entire annual flow of the Saskatchewan were stored on the lake the level would rise on the average by less than 3 feet. This does not occur because outflow from the lake down the Nelson River is continuous. However, the lake level does rise as inflows from the Saskatchewan and other tributaries occur faster than the outflow occurs down the Nelson channel. The excess water that goes into storage on the lake is later depleted as the inflows become less than the outflow capacity. The net effect is that peak summer flows are reduced, stored, and later released to maintain winter flows as the lake level falls.

Clearly, the origin of the hydrologic regime of a river lies fundamentally with the sun and atmospheric circulation, but processes that determine the timing and quantity of river flows are a function of the geometry and substance of the landscape that the river drains. The landscape that sets the unique pattern of rivers in Manitoba will be discussed in Part II of "Manitoba Rivers".

Dr. R. W. Newbury,
Associate Professor,
University of Manitoba,
Civil Engineering.

From The President

This issue of Zoolog marks the beginning of what we hope will be a long and profitable association between the Natural History Society of Manitoba and the Zoological Society. In it you will find several articles contributed by members of the Natural History Society indicating the joint involvement of our two Societies in the publication of Zoolog. This coming winter will see additional evidence of our joint operations as members of the Zoological Society are welcomed to our annual winter lecture series.

Cooperation between two organizations representing similar concerns is essential today when so many pressures exist to change the face of the land for man's expanding needs. Such changes are not in themselves objectionable, but to naturalists who value such things as natural beauty, wildlife and fresh air, the price is often high in the things we value. Manitoba's continued economic development is essential if we are to continue to enjoy our present standard of living. But this standard of living cannot be maintained, particularly in face of an increasing population, without increased demands on our natural resources.

But do these economic advances cost us dearly in the loss of our natural heritage? Do the ends justify the means? Can economic viability be sustained at the expense of important elements of our environment?

It is the role of our organizations to provide the objective conscience to ensure that it is not.

Organizations of concerned individuals such as make up the membership of our two Societies, can act as a balance presenting our case in the decision-making forums of our society. But we can only act with knowledge and understanding of the many factors that influence decisions at all levels of government.

Our Societies have much to gain through joint effort in such debates. United we will be a voice to be heard and one which will be recognized as representing constructive thinking. Each group will still preserve its own specific identity and area of interest but our efforts at joint operation and endeavour may mark the first stop to a federation of similarly-minded groups that will speak with one loud, clear voice about the wise development of the natural resources of Manitoba for the benefit of all.

John Jack,
President,
The Natural History Society of Manitoba

Winter Program

A varied and interesting series of winter evening programmes is being lined up by the Manitoba Natural History Society's program committee for the 1969-70 season.

And this year, to give added spice to the familiar and attractive pattern of talks on birds, mammals, plants and archaeology, special emphasis is being given to the controversial theme of man's relationship to nature. Under the general theme of 'Man, Predator and Provider,' a number of the programmes will examine what effect humankind is having on the natural environment. Such timely issues as pollution, economics versus conservation, and pesticides will be featured topics.

Among those speakers already confirmed is William Pruitt, who has just joined the staff of the University of Manitoba from Memorial University in St. John's, Newfoundland. He's the author of a fascinating study called 'The Ecology of Snow,' and he'll be sharing with us his knowledge of the effects of winter on wildlife.

Robert Taylor, that energetic and talented young man from the Manitoba Museum of Man and Nature, pays a return visit on our program this year. Bob's lecture on nature photography illustrated by his own superb photos was one of the highlights of last season's series, and this year, he'll be returning with what he describes as an experimental 'multi-media presentation on birds, mammals and plants.' Sounds intriguing, Bob!

And intriguing . . . or baffling . . . describes the title of another programme in our coming winter season. 'The Oogling Owl' is the title Peter Press has given his special presentation, coming up early in January. Just what Peter has up his sleeve is something we'll have to wait to see, but everyone who knows our popular membership chairman will agree that it should be an entertaining and informative evening.

The University of Manitoba is rapidly becoming Canada's major research centre on freshwater fish, and one of the University's best-known experts in this field, Dr. Cass Lindsey, will be a guest speaker in our series this year. Another University guest will be the new director of instructional media, Quinton Brown, who'll be sharing with us his ideas on how to take full advantage of field trips.

An old friend of the Society will be joining us December 15th for what we've billed as 'an affectionate look at the natural history of Northern Manitoba.' Gerry Malaher, the former director of wildlife for the province of Manitoba, will bring us the benefit of more than 35 years experience afield in northern Manitoba.

And among the speakers on the theme series 'Man, Predator and Provider' will be Robert Newbury of the University of Manitoba staff, who'll be addressing his attention and ours to the important issue of water conservation.

Oh yes, and with 'participation' and 'involvement' the trend these days, the program committee has promised that members will have a chance to participate and become involved fully in the program this coming year. Watch for announcement of a special evening in which you and every member will have the opportunity of playing an active role.

That's just a sketchy look at some of the programmes already confirmed for the coming season. As mentioned before, full details of the winter series will be forwarded to members shortly.

As usual, the winter meetings will be held in the auditorium of the Manitoba Museum of Man and Nature (convenient parking in the city hall parkade). We're indeed indebted to the Museum for allowing us the use of this splendid meeting place.

Dates of the meetings are the first and third Monday of each month, beginning in October. The season will conclude with the annual meeting April 20, and the annual dinner May 4.

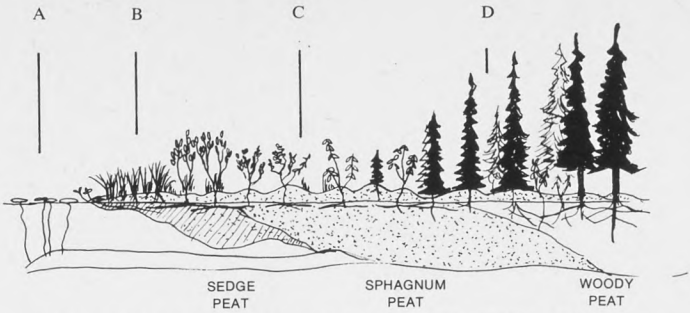
Lorne Wallace

Our wetland heritage

Water is one of the most important elements in our lives and one of the most aesthetically pleasing when in a scenic context. Who is not stirred by the grandeur of the Niagra Falls or the reflection of mountains and trees in a calm lake or the flight of ducks over a marsh? The presence of water allows for the creation of a fascinating environment, whether it is merely a temporary puddle or has the continuing history of a vast lake. Fast flowing streams, slowly meandering rivers, small shallow ponds, deep persistent lakes, cattail marshes, spruce bogs are all aquatic habitats. Two of these habitats — bogs and marshes — frequently encountered in Manitoba will be briefly discussed here.

Bogs are widely distributed over the humid parts of the globe, particularly in the cold northern forested regions. They differ from marshes in form, structure, flora and fauna. Bogs develop wherever drainage is blocked. The open water becomes colonized by floating plants such as water lilies and pondweeds which are flexible enough to withstand the buffetting of the wind and waves. Their growth causes organic material to accumulate on the bottom building it up. Reeds, sedges and Cotton Grass grow in the shallow water and Sphagnum moss appears, filling in the open spaces and consolidating the mass. Slowly a Sphagnum mat is formed and other species such as Bog Laurel and Sweet Gale invade. The herbaceous vegetation is cushion-like and in time, as the cushions grow, species intolerant of the original very wet conditions appear. Among them are a variety of ericoid or heath shrubs, and trees such as Larch and Black Spruce. In due course the open water becomes covered with vegetation, the Shrub zone becomes denser and the forest of Larch and Black Spruce thickens and advances towards the centre of the lake. The animal life of bogs is generally restricted and some groups, for example molluscs, are noticably absent. Fish are rare, however, among the animals expected would be frogs, warblers, bog lemmings and Moose.

The physical conditions that exist in bogs, such as poor drainage and constant saturation with water, create anaerobic conditions. These coupled with cold temperatures slow down biological activity and organic debris, a result of life, is therefore only partly decomposed and accumulates as peat. This releases humic acids which tinge the water brown. The water in the Sphagnum mat is always acid, because Sphagnum and peat can both absorb bases from dissolved salts in the water, thereby freeing acids. It is the acid condition of bogs that accounts for their unique vegetation and promotes peat production. Peat has found a number of economic uses; as a fuel, as a horticultural packing for plants and as an additive for soils poor in organic matter.



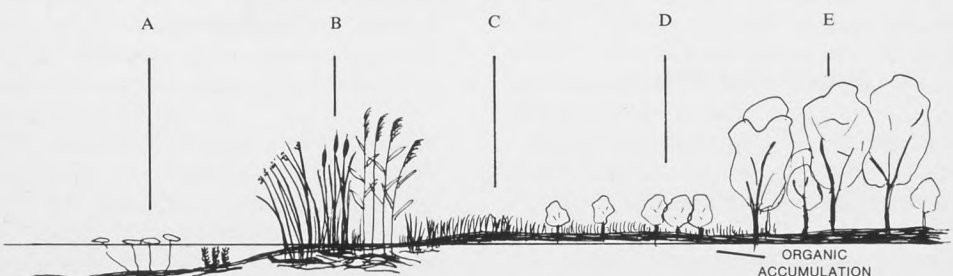
TRANSECT THROUGH A BOG SHOWING VEGETATION ZONES

A Floating plants
B Sedges, Cotton Grass and Sphagnum
C Shrub zone — Bog Laurel and Sweet Gale
D Black Spruce and Larch.

Freshwater marshes are more widespread than bogs in distribution, they develop in the shallow margins of slowly flowing water, lakes, ponds and potholes wherever water is present above the soil surface for several months of the year. The bottom is usually covered with soft muck rich in decaying organic matter mixed with silt and sand. In the shallow water submerged and floating plants thrive and with them stands of Cattail, Bulrush and Giant Reed Grass. All have flexible leaves that bend in wind and water. Their underground rhizomes and roots form a firm mat around which organic material collects building up the bottom. Further from the water's edge where standing water disappears in the summer, the reedswamp zone is invaded by sedges and grasses of the wet meadow type. In the natural course of development, drainage improves and causes a gradual shift of species towards the water. The emergent reedswamp plants invade the water, the wet meadow species move into the reedswamp and the upper reaches of the wet meadow become invaded by willows and alders. The animal life of marshes is rich and varied and includes fish, molluscs, aquatic insects of many kinds, waterfowl, blackbirds, herons and other birds. Muskrat, Skunks and Racoons are common mammals. Freshwater marshes play an important role in the production of waterfowl, Muskrats and even in the lives of some naturalists and research workers!

Both bogs and marshes are dynamic communities because they are constantly changing and plant and animal succession taking place. There may be natural setbacks in the in-filling of either habitat — a flood may cause plants to die out — but unless there is a continuous inflow of water, the characteristic vegetation of both will in time be replaced by terrestrial vegetation. The in-filling of a small shallow pond may only take a few years, but that of an extensive lake may take thousands of years unless the process is accelerated by man. Let's make sure that a variety of these habitats is preserved for man's future enjoyment and research, by now setting them aside as nature reserves or natural areas.

Jennifer M. Walker

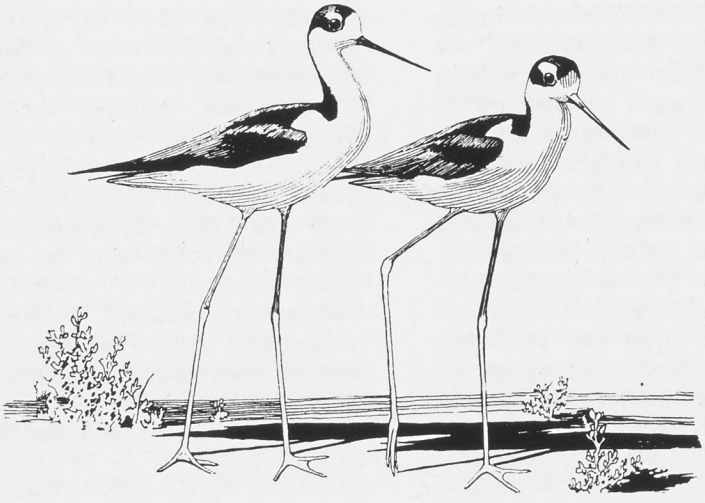


TRANSECT THROUGH A FRESHWATER MARSH SHOWING VEGETATION ZONES

A Submerged and floating plants
B Reedswamp
C Wet meadow
D Willow invasion
E Forest

A Summer Incident

Harold Hosford



Black-Necked Stilts

Range maps in bird books can be misleading affairs. By various means — colors, hatched areas, broken and solid lines — the author attempts to graphically describe the geographic area in which a species is normally found. The result is static. The reader is usually left with the impression that range limits can be defined on the ground almost like a fence.

In fact, this couldn't be farther from the truth. The range of any form of life is a dynamic, pulsating process of interplay between species and their environment. Through individuals within a population, range limits are continually being tested and extended. Conflict between species occupying similar niches constantly affects the limits of ranges. Climate too plays a part in creating new habitat for one species while destroying habitat for another.

No, far from being static, ranges are always under alteration and the trend seems to be towards expansion.

This mysterious process of change adds one of the richest spices to the sport of bird-watching. The chance to turn up a rarity, a straggler, far from its normal range, is the fuel that spurs many a naturalist on.

To some, these discoveries may mean little more than an opportunity to add one new species to their life list. To others, the more serious students, greater significance is attached to such finds. Most of all they raise several questions, usually founded on why such incidents occur.

Is the occurrence an isolated incident, an accident, or is it part of a grand pattern involving similar records from many parts of the country? Has weather played a part in bringing the straggler to us either by sweeping it far off course on storm winds or by changing habitat within the bird's normal range?

Between July 13 and August 10 several bird students in Manitoba had a chance to ponder some of these questions when a Black-necked Stilt made an appearance within our boundaries. Actually, there were two sightings; one at Delta and another at St. Ambroise, 15 miles northeast of Delta. It is probable that the same bird was involved in both observations.

The sightings constitute the first record for this southwestern species for Manitoba. As a matter of fact, there are only two or three records for all of Canada and these, from the eastern part of the country, are obviously accidental. An old breeding record for Saskatchewan is open to question according to Earl Godfrey in "Birds of Canada."

The nearest normal range for the striking black and white stilt is Utah, nearly a thousand miles southwest of the shores of Lake Manitoba.

It will be interesting to see if subsequent reports reveal any other extralimital occurrences of the Black-necked Stilt this summer or will this turn out to be another of those isolated unexplainable incidents which added a bit of color to the summer doldrums for bird-watchers.

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